be withdrawn.

Applicants gratefully acknowledge the suggestions made by the Examiner in paragraph 4 of the Office Action, and have amended claims 2 and 3 to make the corrections suggested or to cancel the affected language in each case.

Claims 9, 14, 15, 17 and 22 stand rejected under 35 U.S.C. 112, second paragraph for various reasons indicated in the Office Action. Each of the issues raised by this rejection have been carefully considered, and appropriate amendments made to address them. It is believed that the amendments made herein overcome all the reasons given for the rejection, and the rejection should accordingly now be withdrawn.

Turning now to the art rejections, claims 1, 2 5, 7, 12-15, 18 and 21 stand rejected under 35 U.S.C. 102(b) as anticipated by Monkelbaan et al. (US 5,554,329).

Monkelbaan, however, requires at least two rows of openings in his sidewalls, one of which is an upper row and the other of which is a lower row, which rows are separated by a central imperforate region (col. 3, lines 16-18). These two rows of openings are ***essential*** to Monkelbaan's invention, as the upper row allows vapor to pass upward through the tray, and the lower row permits liquid to drain downward (col. 3, lines 18-21).

Applicants, by contrast, have a single row of openings, and that row is located in

the central region of Applicants planar surfaces. Applicants openings are therefore located in an area corresponding to the area which Monkelbaan requires to be "imperforate".

Applicants' claims therefore encompass features that are in direct contrast to essential features of Monkelbaan, and Monkelbaan cannot possibly anticipate Applicants' claims.

The rejection of claims 1, 2 5, 7, 12-15, 18 and 21 under 35 U.S.C. 102(b) as anticipated by Monkelbaan et al. (US 5,554,329) should therefore be withdrawn.

Claims 1, 2, 5, 6, 10, 12-15, 18, 20 and 21 stand rejected under 35 U.S.C. 102(b) as anticipated by Hutchinson (US 2,767,967). Hutchinson forms a fractionating tray by "pressing" a "uniformly perforated flat sheet" into a plurality of high and low points (col. 2, lines 25-30). The perforations formed are, as an example, 1/8" round holes on ¼" equilateral triangular pitch (col. 6, lines 15-18). When the "high and low points" are formed, the perforations are then uniformly distributed throughout the entire surface area, with no particular pattern (other than the aforementioned triangular pitch). Any surfaces of Hutchinson's tray which might arguably correspond to Applicants planar surfaces, would have a variety of holes, of no particular pattern through it, which would most likely be distributed over the entirety of said surface. Since the holes are made before the tray is "shaped", it would be impossible to arrive at anything in any way similar to Applicants' single row of spaced-apart perforations.

Accordingly, Hutchinson can not be seen as anticipating Applicants' claims, and the rejection of claims 1, 2, 5, 6, 10, 12-15, 18, 20 and 21 under 35 U.S.C. 102(b) as anticipated by Hutchinson (US 2,767,967) should be withdrawn.

Claims 1, 2, 5, 11-15, 18 and 21 stand rejected under 35 U.S.C. 102(b) as anticipated by King (US 5,605,399). King, however, teaches mixing elements comprised of "parallel beams", which, according to him, break incoming fluid streams into substreams which are reoriented as they depart the mixing array (col. 4, lines 25-28). King also teaches that "...simple holes or screening does not accomplish this function." (col. 4, lines 28-29).

King does not teach or suggest anything such as Applicants' planar surfaces having single rows of spaced-apart perforations substantially central to the surface area of said planar surfaces. Moreover, King teaches away from ***any*** forms of holes (perforations).

King cannot therefore possibly anticipate Applicants' claims, and the rejection of Claims 1, 2, 5, 11-15, 18 and 21 under 35 U.S.C. 102(b) as anticipated by King (US 5,605,399) should now be withdrawn.

Claims 1, 2, 5-10 and 20 stand rejected under 35 U.S.C. 102(b) as anticipated by Pellerin (US 4,295,458). Pellerin discloses a device for use in carburetors of internal

combustion engines, which comprises a truncated cone which is perforated and has "an internal component". This internal component can be:

> "...a shape such as a small upturned centrally perforated cone having its base secured to the minor base of the truncated cone, whereas its perforated apex faces the major base." (col. 2, lines 26-29, Figs 5, 6).

The central perforation or opening in Pellerin's upturned cone (see Fig. 6) results in a device that is nothing like Applicants' and which would, in fact, defeat Applicants purpose of directing the flow paths through Applicants' openings against or across each other, to promote mixing. In the device depicted by Pellerin's Fig. 6, the flow path could proceed directly through the central opening. Moreover, Pellerin does not have planar surfaces having a single row of spaced-apart perforations substantially central to the surface area of said planar surfaces.

Pellerin therefore is quite different than Applicants' static mixing module, and nothing in Pellerin could possibly anticipate or suggest Applicants' static mixing module. the rejection of Claims 1, 2, 5-10 and 20 under 35 U.S.C. 102(b) as anticipated by Pellerin (US 4,295,458) should accordingly now be withdrawn.

Claims 1, 5-9, 12-14, 17, 18, 21 and 22 stand rejected under 35 U.S.C. 102(b) as anticipated by Selg (US 951,290).

Selg however, has "...a series of annular sloping ridges and intervening furrows ***perforated at their bottom as at 17***." This again, is completely different than Applicants' device, and would, in fact, defeat Applicants' purpose of directing the

individual flow streams against each other. Nowhere does Selg teach or suggest anything like Applicants':

> "...planar surfaces having a single row of spaced-apart perforations substantially central to the surface area of said planar surfaces, the individual perforations each defining a flow path through said static mixer module, the flow paths defined by the perforations of one of said two planar surfaces having directions which directly or in extension impinge upon or cross over the flow paths defined by the perforations of the other of said two planar surfaces."

Selg therefore neither anticipates nor suggests Applicants' static mixer module, and the rejection of claims 1, 5-9, 12-14, 17, 18, 21 and 22 under 35 U.S.C. 102(b) as anticipated by Selg (US 951,290) should be withdrawn.

Claims 3 an 19 stand rejected under 35 U.S.C. 103 (a) as obvious over Hutchinson (US 2,767,967). The Examiner thinks he sees a statement in Hutchinson that would have suggested an angle in the range of less than 15 degrees, and also sees Hutchinson as disclosing teeth or warts. Neither a particular angle nor teeth or warts will overcome the differences pointed out above, however, and the addition of same to Hutchinson's device will never convert same to Applicants' static mixer module. The rejection of Claims 3 an 19 under 35 U.S.C. 103 (a) as obvious over Hutchinson (US 2,767,967) should accordingly be withdrawn.

Finally, claim 4 stands rejected under 35 U.S.C. 103(a) as obvious over Hutchinson (US 2,767,967) in view of Sarem (US 3,582,948). The Examiner sees Sarem as disclosing parallel walls of orifices forming an angle of 30 degrees with the walls through which they pass, and concludes that it would therefore be obvious to

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make Hutchinson's orifices 30 degrees which, in his view, would convert Hutchinson's device to Applicants' static mixer modules. First of all, this would make no sense for Hutchinson. Hutchinson needs to have liquid flow down through the perforations in his trays, and needs to have gas flow upwards through it. Introducing angles in his perforations would not appear to help this at all and might, in fact, impede the flows of both. Secondly, introducing such angles will not in any way overcome any of the differences pointed out above between Applicants static mixer module and the device disclosed by Hutchinson.

The rejection of claim 4 under 35 U.S.C. 103(a) as obvious over Hutchinson (US 2,767,967) in view of Sarem (US 3,582,948) should now be withdrawn.

In view of the present amendments and remarks, it is believed that claims 1-4, 6, 7, 10-15, 19, 20, 22 and 23-26 are now in condition for allowance. Reconsideration of said claims by the Examiner is respectfully requested, and the allowance thereof is courteously solicited. Should the Examiner not deem the present amendment and remarks to place the instant claims in condition for allowance, it is respectfully requested that this Amendment Under Rule 116 be entered for the purpose of placing the prosecution record in better condition for appeal.

CONDITIONAL PETITION FOR EXTENSION OF TIME

If any extension of time for this amendment is required, Applicants request that

this be considered a petition therefor. Please charge the required petition fee to Deposit Account No. 14-1263.

ADDITIONAL FEE

Please charge any insufficiency of fee or credit any excess to deposit Account No. 14-1263

Respectfully submitted

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NORRIS, McLAUGHLIN & MARCUS, P.A.

By Julie Harting
Julie Harting
Date June 3, 2003

MARKED-UP COPY OF AMENDED PARAGRAPH, SHOWING CHANGES RELATIVE TO PREVIOUS VERSION

Page 5, paragraph beginning at line 17 (amended).

The orifices in the channel walls of the mixer module are usually made in such a way that they are defined by parallel walls which are approximately perpendicular to the channel walls through which they pass. The parallel walls of the **[**channels**]** **orifices** may, however, also form an angle β of $\pm$ 30 degrees to the channel walls.

MARKED-UP COPIES OF AMENDED CLAIM(S), SHOWING CHANGES RELATIVE TO PREVIOUS VERSION(S)

Claim 1 (four times amended) [Static mixer module, comprising a one piece disc having a front side and a rear side which is provided with a multiplicity of orifices and which is structured on its front side by inlet channels and on its rear side by mixing channels running parallel to each other or concentrically to each other, and defined by channel walls, and in which the orifices pass through the walls defining the mixing channels] **A static mixer module comprising:**

a generally ring-shaped support structure having a central axis, concentric inner and outer, radially spaced, circumferentially extending surfaces, and first and second axially spaced, generally parallel edge surfaces,

said edge surfaces being in respective generally parallel transverse planes which are essentially perpendicular to said central axis,

an inner web supported by said support structure, defining at least one pair of concentric annular surfaces which, in radial cross-section, define a V,

the annular surfaces each having a single circumferential row of

spaced-apart individual perforations along the mid-section thereof, the individual perforations each defining a flow path through said static mixer module, the flow paths defined by the perforations of one of said pair of surfaces having directions which directly or in extension impinge upon or cross over the flow paths defined by the perforations of the other of said pair of surfaces .

Claim 2 (four-times amended). Static mixer module according to Claim 1, wherein the [inlet channels, the mixing channels, or both, have straight channel walls which] **concentric annular surfaces** are at an angle α of 5 degrees to 85 degrees to **one of said parallel transverse planes** [the plane which is perpendicular to the center axis passing through the radial center of the disc, said center axis being parallel to the surfaces defining the circumference of the disc, on the front side of the disc, on the rear side of the disc or both].

Claim 3 (four-times amended). Static mixer module according to Claim 1, wherein the [walls of the inlet channels, of the mixing channels or both are straight and] **concentric annular surfaces** are at an angle α smaller than 15 degrees to **one of said parallel transverse planes** [the plane which is perpendicular to the center axis passing through the radial center of the disc, said center axis being parallel to the surfaces defining the circumference of the disc, on the front side, on the rear side , or both] and wherein the mixer module has **a front side and rear side, and** [additional] spacer contours on the front side, the rear side, or on both.

Claim 4 (four-times amended). Static mixer module according to claim 1 **or 23**, wherein the [orifices] **perforations** are defined by parallel walls and the parallel walls of the [orifices] **perforations** form angles β defining ± 30 degrees to the [walls] **surfaces** through which they pass.

Claims 5, 8, 9, 17, 18 and 21 please cancel.

Claim 6 (three-times amended). Static mixer module according to Claim 1, wherein the mixer module is divided into two or more regions or segments which have differently arranged **annular surfaces**, differently structured **annular surfaces**, or both[, inlet channels, mixing channels, or both].

Claim 7 (twice amended). Static mixer module according to Claim 1 **or 23**, wherein the mixer module is divided into two or more regions or segments which have different spacings between the [orifices] **perforations**, [a] different cross-sectional openings of the [orifices] **perforations**, or both.

Claim 10 (three-times amended). Static mixer module according to Claim 1 **or 23**, wherein the module has **a front side and a rear side, with** baffle surfaces on the front side.

Claim 11 (twice amended). Static mixer module according to Claim 1 **or 23**, wherein the module consists of alloyed steel, non-ferrous metal, plastic, glass, ceramic or a catalytically acting alloy.

Claim 12 (twice amended). Mixer arrangement, comprising at least two static mixer elements arranged one behind the other, wherein at least one mixer element is a [disc-shaped] static mixer module according to Claim 1 **or 23**.

Claim 13 (twice amended). Mixer arrangement according to Claim 12, [wherein, in the mixer arrangement,] **comprising** at least two [disc-shaped] static mixer modules according to Claim 1 **or 23, which** are arranged directly one behind the other **or comprising at least one static mixer module of claim 1 and at least one static mixer module of claim 23 which are arranged directly one behind the other**.

Claim 14 (three-times amended). Mixer arrangement according to Claim 13, wherein [the disc-shaped] **said at least two** static mixer modules are [positioned in such a way that the mixing channels of one of said mixer modules are arranged so as to be offset or] rotated **about their central axis** relative to [the inlet channels of the other of said mixer modules] **each other**.

Claim 15 (three-times amended). Mixer arrangement according to Claim 14, wherein [the] **said at least** two static mixer modules [have parallel sets of straight inlet

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channels and mixing channels and the mixing channels and inlet channels of the two modules] are rotated relative to one another at an angle Y of 5 degrees to 175 degrees.

Claim 20 (amended). The static mixer module of Claim 10, wherein said baffle surfaces are flattenings [(18)] or sheet-like elevations [(19)].

Claim 22 (three-times amended). Mixer arrangement according to claim 12, comprising at least one **static mixer** module which is divided into two or more regions or segments each of which has different spacings between the [orifices] **perforations** or different sizes of [orifices] **perforations**, [and wherein the distance between the planes which lie across and touch the highest elevations, in the direction of the center axis of the disc shaped module, said center axis being parallel to the surfaces defining the circumference of the disc, on the front side and on the rear side of the module is different in the various regions or segments,] said module being followed directly by a static mixer element or a [disc-shaped] static mixer module adapted to nest with [the module] **it**.